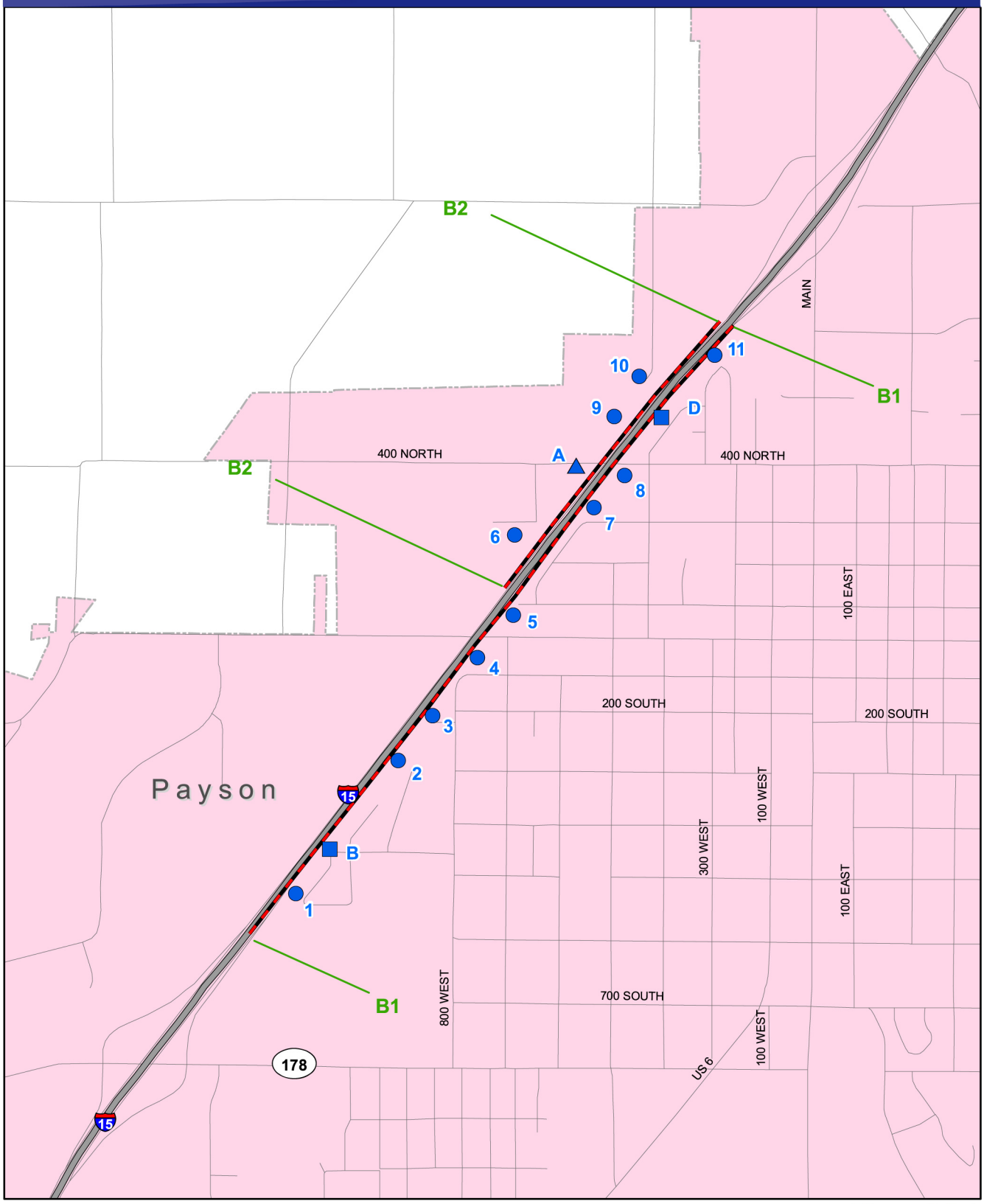

Figure 3.7-1

Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

24-Hour Measurement

Short-Term Measurement

Modeled Site

Proposed Noise Barrier

B1 Proposed Noise Barrier Number

Miles

0 0.5

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

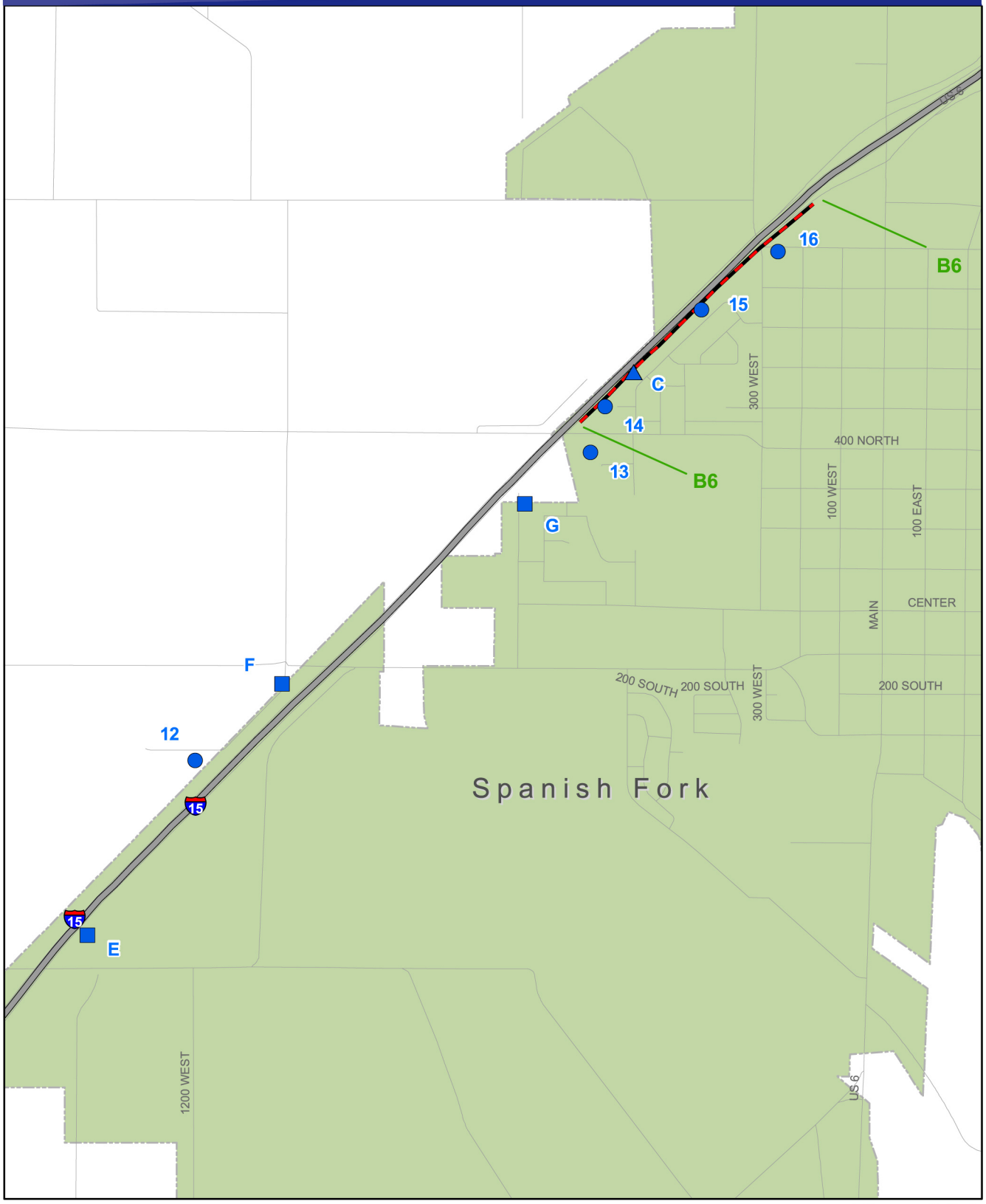

Figure 3.7-2
Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

24-Hour Measurement

Short-Term Measurement

Modeled Site

Proposed Noise Barrier

B1 Proposed Noise Barrier Number

Miles

0 0.5

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

Figure 3.7-3

Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

24-Hour Measurement

Short-Term Measurement

Modeled Site

Proposed Noise Barrier

B1 Proposed Noise Barrier Number

Miles

0 0.5

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

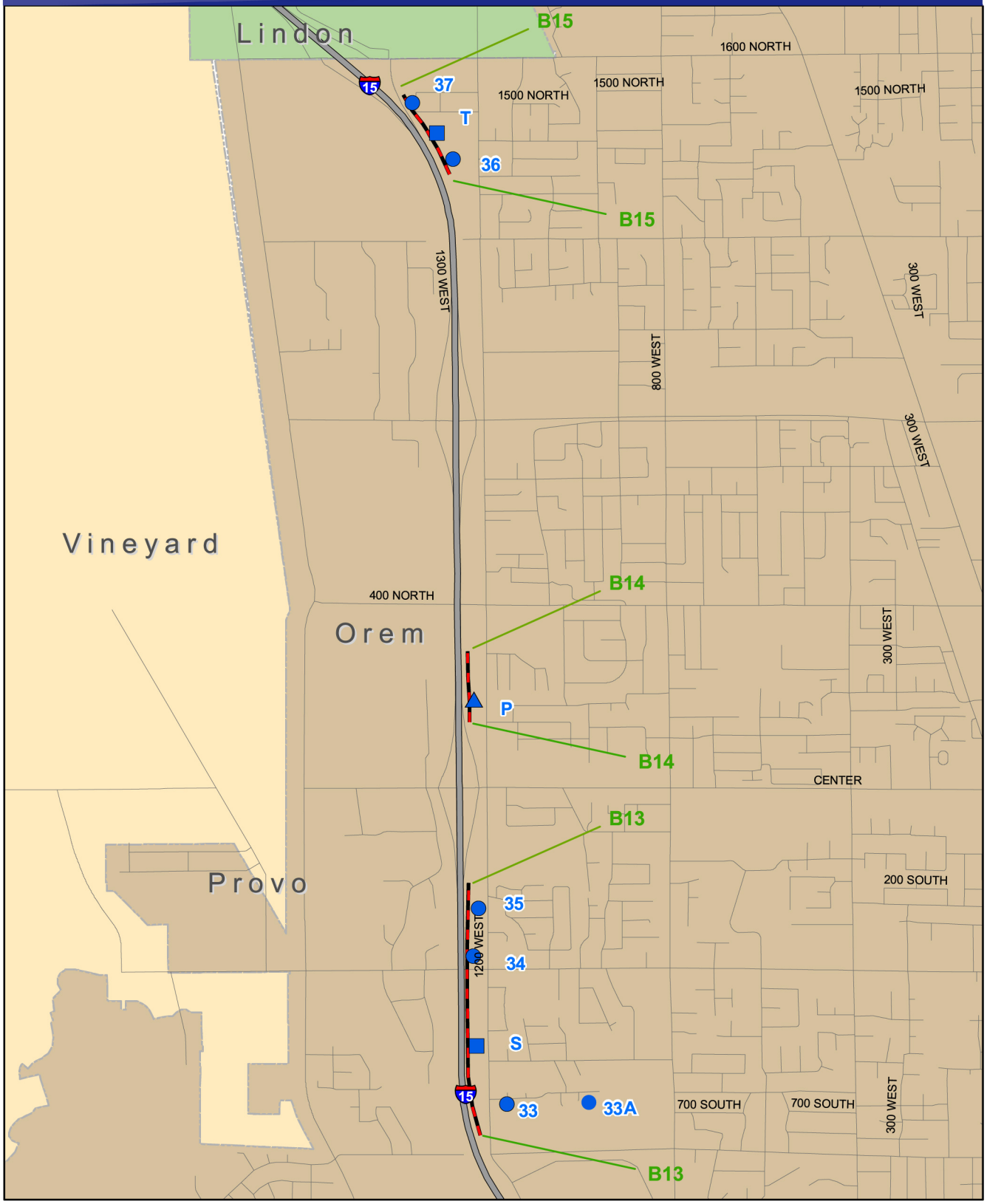

Figure 3.7-4

Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

Proposed Noise Barrier

B1 Proposed Noise Barrier Number

24-Hour Measurement

Short-Term Measurement

Modeled Site

Miles

0 0.5

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

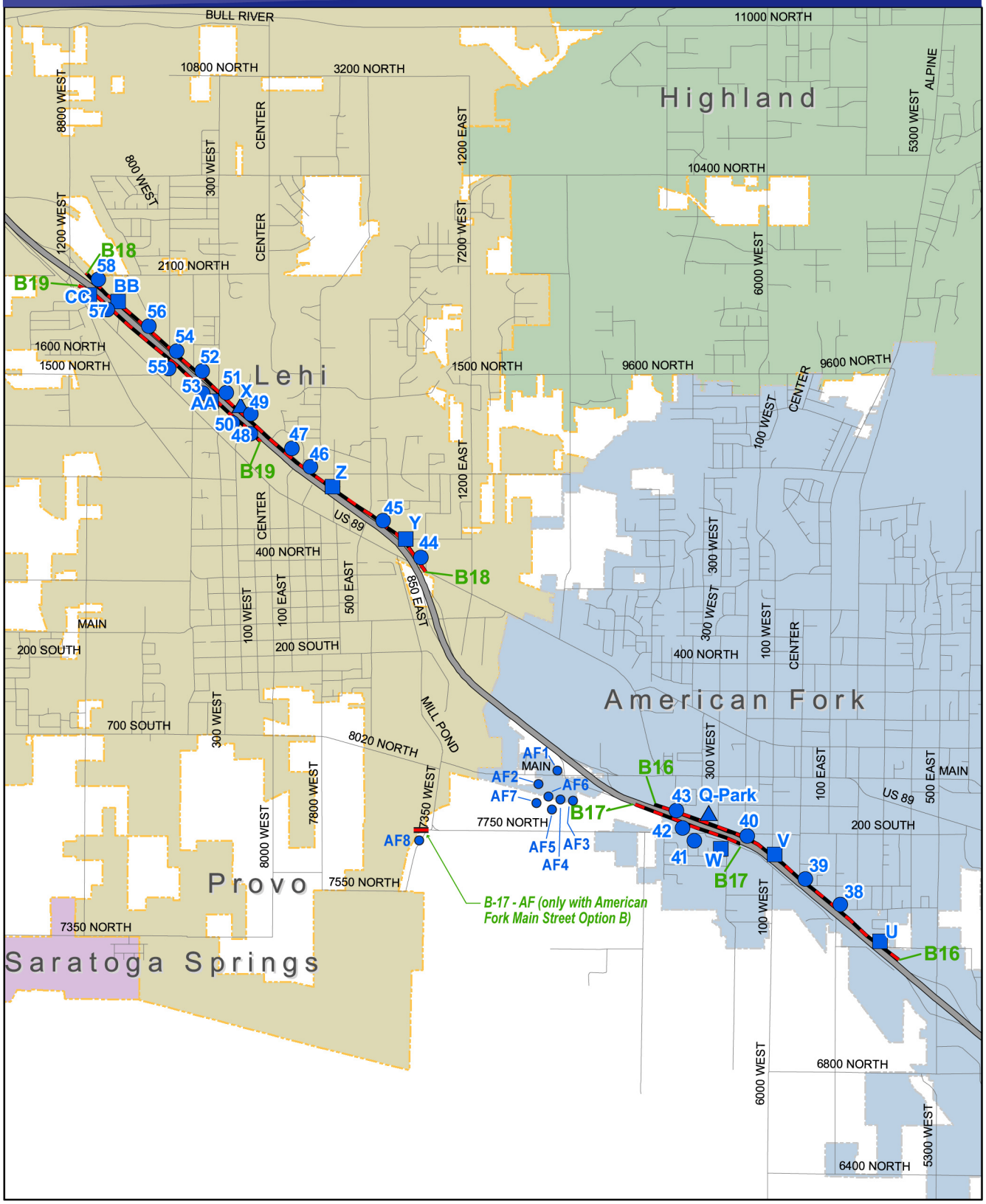

Figure 3.7-5

Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

Proposed Noise Barrier

B1 Proposed Noise Barrier Number

24-Hour Measurement

Short-Term Measurement

Modeled Site

Miles

0 0.5

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

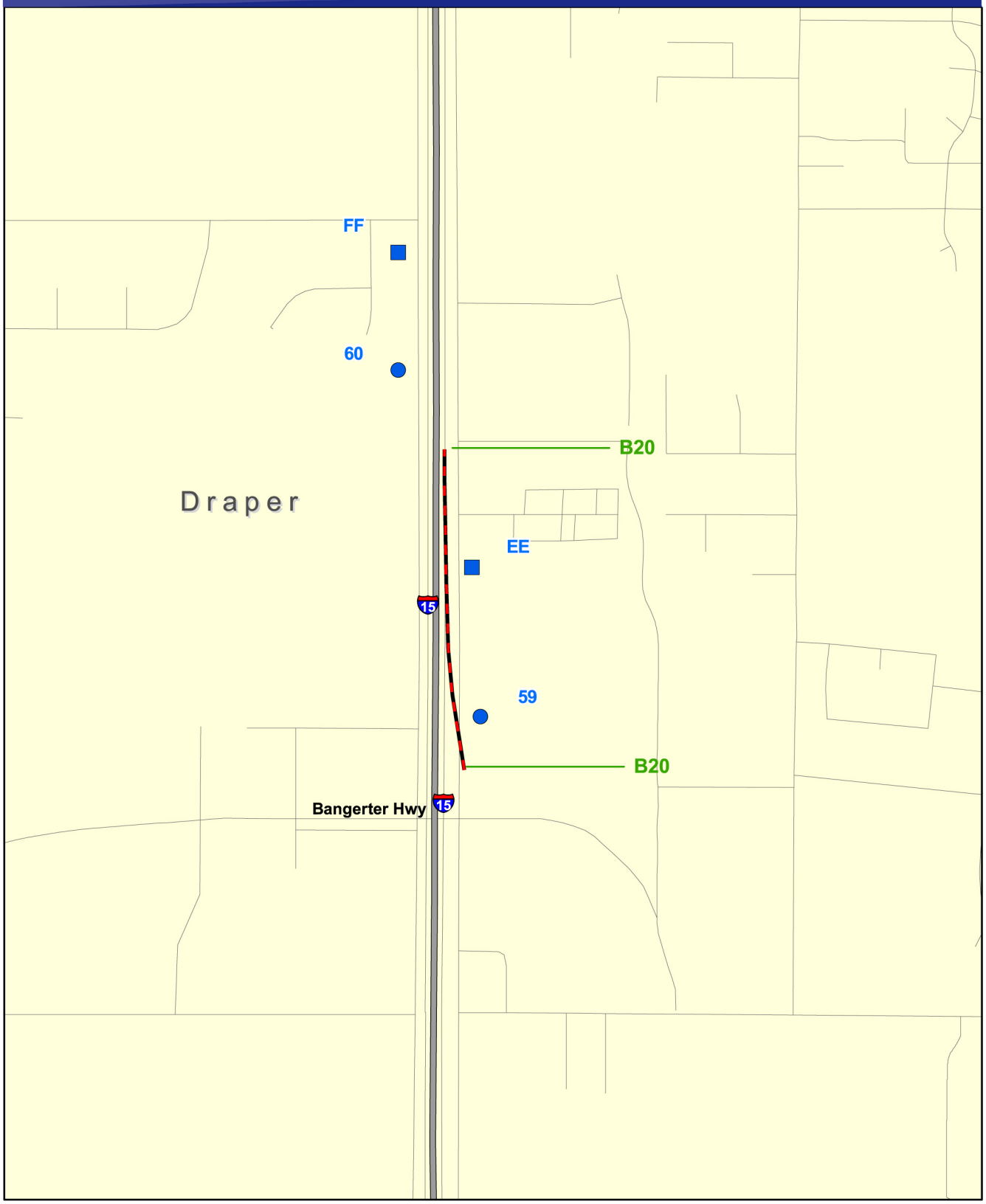

Figure 3.7-6

Receivers and Proposed Noise Barriers

LEGEND

City Boundary

Receiver Type

24-Hour Measurement

Short-Term Measurement

Modeled Site

B1 — Proposed Noise Barrier / Proposed Noise Barrier Number

Miles

0 0.25

Basemap Sources: Salt Lake County, Utah County, and Utah's Statewide Geographic Information Database (SGID)

N

3.7.3 Impacts of Alternatives

This section presents the potential traffic noise levels in 2030 for Alternative 1 and Alternative 4. The peak-hour noise levels for the two alternatives are compared with the existing peak-hour levels that are described in Section 3.7.2. The projected levels are then evaluated with regard to the UDOT Noise Abatement Criteria (NAC). Noise abatement measures for the locations where the projected levels reach or exceed the NAC are described in Section 3.7.4

For federally funded highway projects, noise impacts are defined under the Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772). UDOT has adopted FHWA guidelines and has developed specific noise standards that are found in its Noise Abatement Policy, 08A2-1, updated January 31, 2008. UDOT's highway traffic noise prediction requirements, noise analysis, and noise abatement criteria are consistent with Utah Code 72-6-111 and 112. Noise abatement measures have been considered as part of the alternatives in accordance with UDOT policy, which has been approved by the FHWA.

3.7.3.1 Analysis Methodology

FHWA's Traffic Noise Model (TNM) Version 2.5 computer model (FHWA, 2003) was used to predict Leq (h) traffic noise levels. Noise levels from free-flowing traffic depend on the following factors: (1) the number of automobiles, medium trucks, and heavy trucks per hour; (2) vehicular speed; and (3) reference noise levels of an individual vehicle. TNM also considers the effects of intervening barriers, topography, trees, and atmospheric absorption. Noise from sources other than traffic is not included. Therefore, when non-traffic noise, such as aircraft, is considerable in an area, TNM will under-predict the actual noise level. Noise monitoring results are used to calibrate the baseline conditions noise model.

An electronic file of the Alternative 4 conceptual design, which is shown in Volume II of this EIS, was imported into the TNM package. Major roadways, topographical features, building rows, and sensitive receivers were digitized into the model. Traffic volumes were based on Level of Service C traffic volumes, except on roadways where Level of Service C was not reached by 2030. On roadways with traffic volumes below Level of Service C, traffic volumes are based on the travel forecasting model output described in Chapters 1 and 2 of this EIS. Traffic mix is based on traffic counts taken during field noise measurements in November 2005. Noise measurements in the American Fork Main Street area were taken in October of 2007.

As described in Section 3.7.2, ambient noise levels were measured to describe the existing noise environment, identify major noise sources in the project area, and calibrate the noise model. The noise measurement and modeling locations are shown on Figures 3.7-1 through 3.7-6. Measurement locations are representative of a variety of noise conditions and of other sensitive receivers near the proposed project.

Thirty-five measured sites, which represent approximately 910 residences, were chosen as representative of noise-sensitive locations. One measurement site is used to represent all sensitive receivers in the area that have similar noise exposure to the I-15. For noise model calibration, traffic volumes in the noise model were adjusted to match traffic field counts, then the model was run and the results were compared with measured noise levels. Adjustment factors were applied to TNM to ensure that model results were within 2 dBA of the measured noise levels at the 35 measurement sites. This process ensures that the TNM noise model accurately predicts noise impacts of the project alternatives. The validated models were then run with the existing peak hour traffic volumes, described in Chapters 1 and 2 of this EIS, to calculate the modeled peak hour noise level. At 28 of the sites the modeled peak hour noise levels were within five dBA of the adjusted peak hour noise level. At receiver sites I, J, H and K the TNM modeled noise levels are six to 13 dBA higher then the adjusted peak hour noise levels. The lower measured noise levels at these sites are due to traffic volumes during the measurements being lower than the existing peak hour traffic volumes described in Chapters 1 and 2.

Predicted noise levels were compared to the UDOT Noise Policy, which defines a noise impact as 66 dBA (within 1 dBA of the FHWA NAC of 67 dBA). The numbers of affected receivers were counted for the build alternatives.

Mitigation measures were evaluated using UDOT's reasonableness and effectiveness criteria along with engineering feasibility at receivers where noise levels are modeled to reach or exceed the NAC's and UDOT's noise policy impact level.

Construction noise was qualitatively assessed using EPA reference levels.

Tables 3.7-4 through 3.7-7 show the predicted traffic noise levels from I-15 for the existing conditions, Alternative 1 and Alternative 4. The individual properties that are impacted are illustrated in Volume II of this EIS.

A traffic noise impact occurs when the design year (2030) noise levels reach or exceed the NAC for sensitive noise receivers. Table 3.7-2 lists the UDOT Noise Abatement Criteria. Most of the project corridor is considered Activity Category B. There are no Activity Category A receivers in the project study area. Therefore, if Alternatives 1 and 2 generate a noise level of 66 dBA or greater at a sensitive receiver, or if there is an increase of 10 dBA or more between the existing noise level and the design year (2030), a noise impact occurs.

3.7.3.2 South Utah County Noise Impacts

Table 3.7-4 shows the future peak-hour noise levels of Alternatives 1 and 4 compared with existing noise levels. The number of dwelling units represented by each receiver is also shown.

Alternative 1 peak hour noise levels will increase over the existing peak hour levels by two to five dBA. The NAC (66 dBA) will be reached or exceeded at 22 of the 23 receivers, representing 164 dwelling units. I-15 would not be reconstructed or widened under Alternative 1. Therefore no noise mitigation will be provided.

Alternative 4 peak hour traffic noise levels will increase by three to seven dBA over the existing levels and by one to four dBA over the Alternative 1 levels. The NAC (66 dBA) will be reached or exceeded at all 23 receivers, representing 169 dwelling units. Noise abatement for these impacts is discussed in Section 3.7.4 of this EIS.

Table 3.7-4: Predicted Alternative 1 and Alternative 4 Noise Levels
South Utah County Section

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 Peak Hour Noise Level
1	10	70	72	76
B	12	69	72	75
2	6	70	73	77
3	11	68	71	74
4	9	66	68	71
5	12	66	69	72
6	7	63	67	69
7	6	66	69	72
A	7	63	68	69
8	4	65	68	71
9	10	64	68	70
D	10	70	72	75

Table 3.7-4: Predicted Alternative 1 and Alternative 4 Noise Levels
South Utah County Section – continued

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 Peak Hour Noise Level
10	10	62	66	68
11	8	72	75	78
E	1	70	73	76
12	3	65	67	70
F	1	66	69	71
G	8	65	67	72
13	5	62	64	67
14	5	74	76	79
C	10	74	76	79
15	10	73	75	76
16	4	65	67	68

See Figures 3.7-1 to 3.7-6 for receiver locations

3.7.3.3 Central Utah County Noise Impacts

Table 3.7-5 shows the future peak-hour noise impacts of Alternatives 1 and 4. This section of the I-15 project includes options through Provo and Orem.

Table 3.7-5: Predicted Alternative 1 and Alternative 4 Noise Levels
Central Utah County Section

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 Options A and B Peak Hour Noise Level	Alternative 4 Options C and D Peak Hour Noise Level
I	12	64	65	80	80
17	10	64	66	77	77
18	6	66	67	81	81
19	7	63	64	75	75
20	7	63	64	72	72
21	7	64	66	75	75
22	7	63	64	74	74

Table 3.7-5: Predicted Alternative 1 and Alternative 4 Noise Levels
Central Utah County Section – continued

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 Options A and B Peak Hour Noise Level	Alternative 4 Options C and D Peak Hour Noise Level
J	9	63	65	**73**	**73**
H	10	76	79	**79**	**79**
23	10	62	63	**73**	**73**
24	7	62	63	**74**	**74**
25	8	62	64	**73**	**73**
26	12	64	65	**75**	**75**
27	8	63	64	**73**	**73**
28	14	65	66	**77**	**77**
K	15	63	64	**73**	**73**
29	11	63	64	**73**	**73**
30	12	64	65	**75**	**75**
L	29	64	66	**76**	**76**
M	22	68	71	**73**	**73**
31	5	67	71	**70**	**70**
N	14	65	65	**68**	65
32	13	74	77	**77**	**75**
O	6	78	80	**82**	**82**
R	4	65	68	**69**	**69**
33	8	64	66	**67**	**67**
33A	8	53	56	**59**	58
S	10	74	76	**78**	**78**
34	11	75	77	**79**	**79**
35	10	72	73	**76**	**76**
P	18	74	76	**79**	**79**
36	32	66	68	**69**	**69**
T	32	68	71	**72**	**72**
37	64	75	77	**79**	**79**

See Figures 3.7-1 to 3.7-6 for receiver locations

The Alternative 1 2030 peak noise hour levels will increase over the existing levels by 0 to four dBA. The NAC (66 dBA) will be reached or exceeded at 19 of the 34 receivers, representing 311 dwelling units. Noise abatement will not be considered for Alternative 1 because no changes are proposed for I-15.

Options A, B, C and D in Alternative 4 will result in 2030 peak noise hour level increases of 0 to 16 dBA over the existing levels and by 0 to 15 dBA over the Alternative 1 2030 peak noise hour levels. At Receivers N and 32, the four options move the centerline of I-15 further away. Options A and B add frontage roads in this area. With the frontage roads, the traffic noise levels at Receiver N and 32 at peak hour traffic volumes are 0 to 3 dBA higher than Alternative 1 levels. Options C and D do not include the frontage roads. Without frontage roads, the traffic noise levels at Receiver N is the same as Alternative 1, and at Site 32 the noise level is 2 dBA lower than Alternative 1.

The increase in noise level by 10 dBA or more at Receivers I, J, K and L, and at 17 through 20, is the result of the removal of existing sound walls to allow for the widening and reconstruction of I-15. The existing noise walls would be reconstructed. The NAC (66 dBA) will be reached or exceeded at 33 of 34 receivers, representing 405 dwelling units, with Option A and B. If Options C and D are built the NAC (66 dBA) will be reached or exceeded at 32 of the 34 receivers, representing 436 dwelling units. Noise abatement is considered for all options in Alternative 4 and is presented in Section 3.7.4.

The Preferred Alternative includes Option D in this area, which has been refined to include the 820 North re-alignment. Receiver 31 is the closest receiver to the proposed re-alignment. The analysis shows a predicted noise level of 70 dBA, one dBA less than Alternative 1.

3.7.3.4 North Utah County Noise Impacts

Table 3.7-6 shows the impact of Alternatives 1 and 4 on identified receivers. Alternative 1 peak hour noise level will increase over the existing levels by two to four dBA. The NAC (66 dBA) will be reached or exceeded at 29 of the 39 receivers, representing 229 dwelling units. Noise abatement will not be considered for the No Build Alternative because no changes are proposed for I-15.

Alternative 4 has three options for the interchange at American Fork Main Street. Alternative 4 with American Fork Main Street Option A will result in an increase in peak hour traffic noise levels by three to nine dBA over the existing levels and by 0 to 7 dBA over the Alternative 1 levels. The NAC (66 dBA) will be reached or exceeded at 31 of 39 receivers, representing 243 dwelling units. Alternative 4 with American Fork Main Street Option B will result in an increase in peak hour traffic noise levels by up to 25 dBA over the existing levels and by 0 to 23 dBA over the Alternative 1 levels. The NAC (66 dBA) will be reached or exceeded at 36 of 39 receivers, representing 263 dwelling units. Alternative 4 with American Fork Main Street Option C will result in an increase in peak hour traffic noise levels three to nine dBA over the existing levels and by 0 to seven dBA over the Alternative 1 levels. The NAC (66 dBA) will be reached or exceeded at 30 of 39 receivers, representing 242 dwelling units. Noise abatement is considered for this section and is presented in Section 3.7.4.

Table 3.7-6: Predicted Alternative 1 and Alternative 4 Noise Levels
North Utah County Section

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 AF Main Street Option A Peak Hour Noise Level	Alternative 4 AF Main Street Option B Peak Hour Noise Level	Alternative 4 AF Main Street Option C Peak Hour Noise Level
U	14	75	77	79	79	79
38	9	70	72	73	73	73
39	12	76	78	82	82	82
V	10	77	79	83	83	83
40	9	74	76	79	79	79
W	10	63	65	67	67	67

Table 3.7-6: Predicted Alternative 1 and Alternative 4 Noise Levels
North Utah County Section – continued

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 AF Main Street Option A Peak Hour Noise Level	Alternative 4 AF Main Street Option B Peak Hour Noise Level	Alternative 4 AF Main Street Option C Peak Hour Noise Level
Q	8	68	70	71	71	71
41	12	66	68	69	69	69
42	5	69	71	73	73	73
43	13	74	76	78	78	78
AF-1	1	66	66	73	66	65
AF-2	1	56	57	63	59	63
AF-3	1	59	59	60	Demolished by Option B. Is within proposed ROW.	62
AF-4	2	55	55	58	69	59
AF-5	1	56	57	59	69	60
AF-6	1	55	55	57	70	58
AF-7	1	55	55	57	71	57
AF-8	15	46	48	53	71	53
44	7	65	68	65	65	65
Y	7	68	71	70	70	70
45	8	74	77	78	78	78
Z	10	71	74	76	76	76
46	6	67	70	72	72	72
47	7	67	70	71	71	71
48	15	72	75	77	77	77
49	3	75	79	77	77	77
50	10	68	72	73	73	73
51	4	67	70	71	71	71
X	7	68	71	72	72	72
AA	9	63	66	72	72	72
52	3	67	71	76	76	76

Table 3.7-6: Predicted Alternative 1 and Alternative 4 Noise Levels
North Utah County Section – continued

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 AF Main Street Option A Peak Hour Noise Level	Alternative 4 AF Main Street Option B Peak Hour Noise Level	Alternative 4 AF Main Street Option C Peak Hour Noise Level
53	6	61	65	72	72	72
54	8	69	73	76	76	76
55	5	61	64	68	68	68
56	5	72	76	77	77	77
BB	11	73	76	80	80	80
57	3	71	74	74	74	74
CC	5	70	74	74	74	74
58	6	68	71	72	72	72

See Figures 3.7-1 to 3.7-6 for receiver locations

3.7.3.5 South Salt Lake County Noise Impacts

Table 3.7-7 shows the impact of Alternatives 1 and 4 on identified receivers.

Alternative 1 will increase noise over the existing peak hour traffic noise levels by one to two dBA. The NAC (66 dBA) will be reached or exceeded at all four receivers, representing 49 dwelling units. Noise mitigation will not be considered because no changes to I-15 are being considered.

The Alternative 4 peak hour traffic noise levels will increase by two to four dBA over the existing levels and will increase by 0 to two dBA over the No Build levels. The NAC (66 dBA) will be reached or exceeded at all four receivers, representing 49 dwelling units. Noise abatement is considered in this geographic section and is presented in Section 3.7.4.

Table 3.7-7: Predicted Alternative 1 and Alternative 4 Noise Levels
South Salt Lake County Section

Note: Levels listed in bold indicate noise impacts as defined in UDOT's Noise Abatement Policy

Receiver	Number of Dwelling Units	Existing Modeled Peak Hour Noise Level	Alternative 1 Peak Hour Noise Level	Alternative 4 Peak Hour Noise Level
59	4	72	74	74
EE	32	73	75	75
60	6	72	74	76
FF	7	74	75	76

See Figures 3.7-1 to 3.7-6 for receiver locations

3.7.4 Noise Mitigation

When a noise impact is identified, FHWA and UDOT specify that noise abatement must be considered and if found to be feasible, and reasonable, would be incorporated into the project design after balloting results indicate a desire for noise abatement. When determining the feasibility and reasonableness of noise abatement, UDOT's Noise Abatement Policy must be followed. Based on the current design there are reasonable and feasible noise abatement measures that reduce traffic noise levels at many of the impacted receivers.

In accordance with FHWA guidelines, several noise abatement measures were considered to reduce highway generated noise impacts. These measures included traffic management strategies, alteration of horizontal and vertical alignments, creation of buffer zones, acquisition of property rights for construction of noise barriers, sound insulation for public institutions and construction of noise barriers or berms within the I-15 right-of-way.

These mitigation measures were evaluated for their potential to reduce noise impacts from the proposed action. The results of the evaluation are summarized below.

Traffic Management Measures

Management measures could include restricting the times of day when travel is permitted, restrictions on truck traffic, modified speed limits, and exclusive land designations. As I-15 is an interstate freeway, a NAFTA and a CANAMEX corridor, restriction of travel times and restrictions on traffic are not consistent with its role in the regional and national transportation system. Traffic management measures are therefore not feasible as a noise mitigation measure.

Land Use Controls

As stated in the FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance (1995)", "The Federal Government has essentially no authority to regulate land use planning or the land development process." UDOT also does not have authority over land use control and planning. Therefore, neither FHWA nor UDOT can implement noise attenuation through land use controls to mitigate for the noise impacts of Alternative 4.

Acquisition of Property to Serve as a Buffer Zone

The FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance (1995)" states that:

> "The potential use of buffer zones applies to predominantly unimproved property. This authority is not used to purchase homes or developed property to create a noise buffer zone. It is used to purchase unimproved property to preclude future noise impacts where development has not yet occurred."

There is little undeveloped property along the I-15 corridor that would afford this opportunity. As shown in the aerial photography mapping contained in Volume II of this EIS, the majority of property adjacent to I-15 is developed. Acquisition of this predominately developed property to serve as a buffer zone for the I-15 interstate would not comply with FHWA guidance.

Alteration of Roadway Horizontal and/or Vertical Alignment

Development of Alternative 4 was an iterative process that resulted in minor changes to the I-15 alignment to avoid or minimize impacts to wetlands, cultural resources, and Section 4(f) resources; to accommodate interchanges with cross streets; and to minimize relocations of dwelling units and businesses. Additional changes to the I-15 horizontal alignment would not be a feasible noise mitigation measure as it would likely result in impacts to those resources that the current Alternative 4 conceptual engineering avoids or minimizes impacts to. Changes of the vertical alignment, such as depressing the roadway, would not be reasonable. Based on the conceptual engineering shown in Volume II, lowering the roadway would widen the footprint, resulting in additional direct impacts to adjacent properties, additional relocations of dwelling units and businesses, and additional impacts to wetlands and cultural resources.

Insulation of Public Use, Nonprofit Institutional Buildings

The receivers that would be impacted are not public use, nonprofit institutions and therefore would not be eligible for acoustic insulation.

Noise Barriers

Noise barriers include noise walls and berms. The effectiveness of a noise barrier is determined by its height and length and by the topography of the project site. To be effective, the barrier must block the "line of sight" between the highest point of a noise source, such as a truck's exhaust stack, and the highest part of a receiver. It must be long enough to prevent sounds from passing around the ends, have no openings such as driveway connections, and be dense enough so that noise will not be transmitted through it. Intervening rows of buildings that are not noise sensitive also could be used as barriers.

UDOT Noise Policy defines a feasible noise barrier as one that provides a noise reduction of at least five dBA to at least 75% of front-row (adjacent) receivers.

For a noise barrier to be reasonable under UDOT noise policy the maximum cost must not exceed $30,000 per benefited receiver. A benefited receiver is any impacted or non-impacted receiver that gets a noise reduction of five dBA or more as a result of the noise barrier.

The noise study also assumes that engineering feasibility could be maintained without unforeseen circumstances, such as dealing with utilities, water crossing requirements, drainage, the ability to stay outside the clear zone, and staying within the proposed ROW.

Noise Mitigation during Construction Activities

Construction activities would generate noise during the construction period and would impact the receptors described in Section 3.7. To reduce construction noise at nearby receptors, the following mitigation measures would be incorporated into construction plans and contractor specifications:

- Equipping construction equipment engines with mufflers, intake silencers, and engine enclosures.
- Turning off construction equipment during prolonged periods of nonuse to eliminate noise from construction equipment during those periods.

During the design/construction phase, UDOT will work with the affected cities to establish appropriate limitations that balance construction schedule and construction noise.

3.7.4.1 Proposed Noise Abatement

The form of noise abatement considered in this EIS is noise barriers. UDOT is committed to providing reasonable and feasible noise abatement measures for highway-related traffic noise. These measures include the reasonable and feasible methods for reducing traffic noise levels at receivers in accordance with UDOT's Noise Abatement Policy, and are based on the preliminary design of the Preferred Build Alternative. The final decision on the use of noise abatement measures will be made upon completion of project design and after an opportunity for public involvement and approval at the local, state, and federal levels.

The likely locations of noise barriers are shown on Figures 3.7-1 through 3.7-6. The proposed placement of all barriers is at the edge of shoulder of I-15 of Alternative 4, unless otherwise noted. Barriers are numbered sequentially from south to north and are preceded by the letter "B". The likely location of barriers are also shown on the conceptual design drawings in Volume II of this EIS. The impacted receivers are marked with a green dot on the Volume II drawings.

Tables 3.7-8 to 3.7-11 show the noise abatement measures that have been found to be reasonable and feasible at this stage of design. Each noise barrier is cross-referenced in the tables to the appropriate conceptual design sheets found in Volume II of this EIS.

UDOT's Noise Abatement Policy requires public and local government acceptance of each proposed noise barrier. Noise barriers will be further assessed during the design stage prior to construction. UDOT will contact the local municipality and impacted residents/landowners on both sides of the highway. If a sufficient number of affected residents/land-owners, as defined by the noise policy, vote in favor of noise walls they will be installed.

3.7.4.2 South Utah County

Six noise barriers were modeled in South Utah County. Table 3.7-8 shows the details of these barriers. Only barriers B1, B2 and B6 were found to be both feasible and reasonable.

- B1 was modeled to provide noise abatement to receivers 1, B, 2, 3, 4, 5, 7, 8, D and 11. The noise barrier was found to be both feasible and reasonable.
- B 2 was modeled to provide noise abatement to receivers 6, A, 9 and 10. The noise barrier was found to be both feasible and reasonable.
- B3 was modeled to provide noise abatement to receiver E. The noise barrier was found to be feasible and provided seven dBA of noise reduction at eight feet, but the barrier is not reasonable, since it shields one residence at a cost of $117,916.
- B4 was modeled to provide noise abatement to receivers 12 and F. The noise barrier was found to be feasible and provided six dBA of noise reduction at 12 feet, but the barrier is not reasonable, since it shields three residences at a cost of $203,400 per residence.
- B5 was modeled to provide noise abatement to receivers G and 13. The noise barrier was found to be feasible and provided five dBA of noise reduction at 10 feet, but the barrier is not reasonable, since it shields 13 residences at a cost of $32,300 per residence.
- B6 was modeled to provide noise abatement to receivers 14, C, 15 and 16. The noise barrier was found to be both feasible and reasonable.

Table 3.7-8: South Utah County Noise Barriers

Barrier	Start/End Station # Volume II Sheet #	Receivers Benefited	Barrier Data			Effectiveness and Cost Data				
			Length	Height	Area^	Sensitive Receivers		Noise Reduction	Total Cost	Cost per Benefited Receiver*
						Number Impacted	Number Impacted			
B1 Northbound	477+ 00/ 557+ 00 Sheets 14 to 17	1, B, 2, 3, 4, 5, 7, 8, D and 11	8080	12 ft	96,965 Sq	83	83	6 to 11 dBA	$1,939,298	$23,400
B2 Southbound	557+ 00/ 520+ 00 Sheets 17, 16	6, A, 9, and 10	3585	12 ft	43,026 Sq	35	35	6 to 8 dBA	$860,516	$24,600
B6 Northbound	856+ 00/ 895+ 00 Sheets 27, 28	14, C, 15, 16	3844	8 FT[1]	30,750 Sq	29	29	5 to 7 dBA	$615,000	$24,600

^ Square foot calculation as generated from TNM

*Costs are rounded and based on $20 per square foot.

[1] This 8-foot wall is adequate to achieve a five dBA reduction at Sites 4A and SU15. A higher wall would not be reasonable due to cost

3.7.4.3 Central Utah County

Eight noise barriers were modeled in the Central Utah County section. Table 3.7-9 shows the details of these barriers. B7, B8, B13, B14, and B15 were found to be both feasible and reasonable. B11 was found to provide noise abatement for a severely impacted area.

- B7 was modeled to provide noise abatement to receivers I, 17, 18, 19, 20, J, 24, 25, 27, 28 and K. The noise barrier was found to be both feasible and reasonable. The barrier replaces an existing noise barrier that was in the proposed ROW.
- B8 was modeled to provide noise abatement to receivers 21, 22, H, 23 and 26. The noise barrier was found to be both feasible and reasonable.
- B9 was modeled to provide noise abatement to receivers 29, 30, L, M, 31. The noise barrier was found to be both feasible and reasonable. The barrier replaces an existing barrier and will match to the existing barrier at the southern end point.
- B10 was modeled to provide noise abatement to receivers N, 32. The noise barrier was found to be feasible and reasonable. The barrier would be placed on the new Alternative 4 right-of-way line beginning at STA 1410+00 and ending at STA 1430+00
- B11 was modeled to provide noise abatement to receiver O. Since receiver O predicted noise level is above 80 dBA, the noise barrier cost per residence is not limited by the reasonable allowance. An eight- foot barrier would provide six dBA of noise abatement and cost $46,900 per residence for six buildings.
- B12 was modeled to provide noise abatement to receiver R. The noise barrier was found to not provide at least five dBA reduction at wall heights from eight to 18 feet and therefore, deemed to be unfeasible.
- B13 was modeled to provide noise abatement to receivers 33, 33A, S, 34, 35. The noise barrier was found to be both feasible and reasonable.
- B14 was modeled to provide noise abatement to receiver P. The noise barrier was found to be both feasible and reasonable.
- B15 was modeled to provide noise abatement to receiver 36, T and 37. The noise barrier was found to be both feasible and reasonable. B15 is located on the new Alternative 4 right-of-way.

The impact of the frontage roads in the Provo/Orem Options A and B on noise and the need for noise barriers was analyzed using the TNM model. This analysis used the predicted 2030 hourly volume on the frontage roads and the 40 to 45 mile per hour design speed. The results showed that the noise levels generated by the frontage roads in Options A and B would increase the noise level by 2 to 3 dBA. This additional frontage road noise level in combination with the I-15 mainline noise levels does not change the need for or location of noise barriers for this section of I-15.

All Options A, B, C, and D would require the noise barriers described in Table 3.7-9.

Table 3.7-9: Central Utah County Noise Barriers

Barrier	Start/End Station # Volume II Sheet #	Receivers Benefited	Barrier Data			Effectiveness and Cost Data				
			Length	Height	Area^	Sensitive Receivers		Noise Reduction	Total Cost	Cost per Benefited Receiver*
						Number Impacted	Number Benefited			
B7 Southbound	1345+ 00/1237+ 00 Sheets 41-45	I, 17, 18,19, 20, J, 24, 25 27, 28 and K	10,954	12 ft	131,447 Sq	110	110	5 to 12 dBA	$2,628,942	$23,900
B8 Northbound	1266+ 00/1316+ 00 Sheets 42-44	21, 22 H, 23 and 26	4601	12 ft	55,218 Sq	46	46	7 to 11 dBA	$1,104,356	$24,000
B9 Southbound	1395+ 00/1354+ 00 Sheets 45, 46	29, 30 L, M and 31	4247	16 ft	67,945	68	65	2 to 11 dBA	$1,358,910	$21,500
B10 Northbound	1410+ 00/1430+ 00 Sheets 48, 49	N, 32	2086	14 ft	29,207	27	24	2 to 6 dBA	$584,142	$24,339
B11 Northbound	1430+ 00/1477+ 00 Sheets 48, 49	O	1758	8 ft	14,066	6	6	6 dBA	$281,312	$46,900
B13 Northbound	1559+ 00/1600+ 00 Sheets 52-54	33, 33A, S 34, and 35	3695	12 ft	44,334	39	39	5 to 10 dBA	$886,725	$22,750
B14 Northbound	1620+ 00/1630+ 00 Sheets 54, 55	P	1034	16 ft	16541	18	18	11 dBA	$330,814	$18,400
B15 Northbound	1700+ 00/1713+ 00 Sheet 57	36, T, 37	1404	16 ft	22466	128	128	5 to 7 dBA	$449,318	3,500

^ Square foot calculation as generated from TNM

*Cost are rounded and based on $20 per square foot.

3.7.4.4 North Utah County

The five noise barriers shown in Table 3.7-10 and described below were modeled in the North Utah County section to address noise abatement for sensitive receivers and all were found to be feasible and reasonable.

- B16 was modeled to provide noise abatement to receivers U, 38, 39, V, 40, Q, and 43. The noise barrier was found to be both feasible and reasonable.
- B17 was modeled to provide noise abatement to receivers W, 41 and 42. The noise barrier was found to be both feasible and reasonable.
- B17-AF was modeled to provide noise abatement to receiver AF-8 for American Fork Main Street Option B. The noise barrier was found to be both feasible and reasonable. Barrier AF-1 starts on the edge of shoulder of the eastbound side of the new roadway at the intersection with 7350 West and ends 956 feet to the west.
- B18 was modeled to provide noise abatement to receivers 44, Y, 45, Z, 46, 47, 49, X, 51, 52, 54, 56, BB, and 58. The noise barrier was found to be both feasible and reasonable.
- B19 was modeled to provide noise abatement to receivers 48, 50, AA, 53, 55, 57 and CC. The noise barrier was found to be both feasible and reasonable.

Two other noise barriers were evaluated in the American Fork Main Street area. A noise barrier to provide noise abatement for receiver AF-1 with American Fork Main Street Option A is not feasible because this portion of the new roadway is not access controlled. A noise barrier would block access to adjacent properties. For the same reason, a noise barrier for receivers AF-4 to AF-7 for American Fork Main Street Option B is not feasible.

3.7.4.5 South Salt Lake County

Two noise barriers were modeled in the South Salt Lake County section. B20 was found to be feasible and reasonable.

- B20 was modeled to provide noise abatement to receivers 59 and EE. The noise barrier was found to be both feasible and reasonable. The proposed barrier would start on the EOS of the NB on-ramp from Bangerter Highway, run along the On-ramp EOS and transition to the Main Line EOS.
- B21 was modeled to provide noise abatement to receivers 60 and FF. The noise barrier was found to provide at least five dBA of noise reduction at 12 feet, but the cost per residences is $35,370, which is above UDOT's reasonable cost of $30,000.

3.7.5 Indirect Impacts

No indirect impacts from noise were identified.

Table 3.7-10: North Utah County Noise Barriers – Northbound

Barrier	Start/End Station # Volume II Sheet #	Receivers Benefited	Barrier Data			Effectiveness and Cost Data				
			Length	Height	Area^	Sensitive Receivers		Noise Reduction	Total Cost	Cost per Benefited Receiver*
						Number Impacted	Number Benefited			
B16 Northbound	1931+ 00/ 2010+ 00 Sheets 67-70	U, 38, 39, V, 40, Q, 43	7830	12 ft	93965	76	76	5 to 13 dBA	$1879,306	$24,800
B17 Southbound	2004+ 00/ 1983+ 00 Sheet 69	W, 41, 42	3695	12 ft	44,334	39	39	5 to 10 dBA	$886,725	$22,750
B17-AF Main Street Eastbound *AF Main Street Option B only*	B57 + 00 to B67 + 00 Sheet 70.3B	AF-8	956	18 feet	17,214	15	15	11 to 14 dBA	$342,274	$22,818
B18 Northbound	2101+ 00/ 2220+ 00 Sheets 74-78	44, Y, 45 Z, 46, 47 49, X, 51, 52, 54, 56 BB and 58	12087	10 ft	120,872	104	104	5 to 12 dBA	$2,417,439	$23,250
B19 Southbound	2220+ 00/ 2156+ 00 Sheets 76-78	48, 50, AA, 53 55, 57 and CC	6400	8 ft	51,204 Sq	46	42	5 to 7 dBA	$1,024,075	$24,400

^ Square foot calculation as generated from TNM

*Cost are rounded and based on $20 per square foot